Amendments to the Claims

Please replace paragraph [00162] by the following amended paragraph:

[00162] Figure 18g shows that in order to achieve the required optical and mechanical properties of buffer, the first optimized thermal treatment should preferably be carried out on the above-formed structure consisting of 10.0μm thick buffer 12 on the front (top) face of the wafer 10, its equivalent 10.0μm thick buffer 14 on the back (bottom) face of the wafer, a remaining 0.4 μm thick PECVD silicon nitride layer 16 on the back ~~face~~ side of the wafer under the thick buffer 14, and a compensating 0.3 μm thick PECVD silicon nitride layer 18 on the front face of the wafer[[;]].

Amendments to the Claims

Please amend the claims as follows. This listing of the claims will replace all prior versions, and listings of claims, in the application:

1. (currently amended) A method of ~~reducing stress-induced mechanical problems in optical quality components having a plurality of layers with different refractive indices~~making an optical waveguide having a plurality of layers with different refractive indices, comprising carrying out the following steps in sequence:

a) fabricating a first structure resistant to wafer warp during thermal processing by PECVD (Plasma Enhanced Chemical Vapor Deposition), said first structure comprising a silicon wafer having a first silicon nitride layer on a top ~~front~~ face thereof, a first buffer layer on said first silicon nitride layer, a second buffer layer on a ~~back~~ bottom face of said wafer, and a second silicon nitride layer ~~under~~ underneath and contiguous with said second buffer layer;
b) reducing optical absorption and compressive stress in said buffer layers by subjecting said first structure to a first thermal treatment, said first thermal treatment comprising:
   i) stabilizing a diffusion tube at an initial stabilization temperature lying between 300°C and 700°C;
   ii) inserting said first structure into said diffusion tube of step b(i);
   iii) stabilizing said first structure at said initial stabilization temperature;
   iv) decreasing compressive stress in said buffer layers from an initial compressive value by subjecting said first structure to a temperature that ramps up a rate lying in the range 1°C/min to 25°C/min from said initial stabilization temperature to a constant temperature of between 800°C and 1300°C;
   v) further decreasing compressive stress in said buffer layers and reducing optical absorption by continuing to subject said first structure to said constant temperature in step b(iv) ~~of at least 800°C~~ for a period of at least 30 minutes;
   vi) causing said first structure to undergo an elastic deformation wherein the compressive stress in said buffer layers increases linearly to a final compressive value that is less than said initial compressive value by ramping down said temperature to which said

first structure is subjected to a final stabilization temperature a rate lying in the range 1°C/min to 25°C/min; and

vii) extracting said first structure from said diffusion tube of step b(i) at said final stabilization temperature thereof;

c) depositing a silica core layer on said buffer layer on said front face of the wafer by PECVD to form a second structure;

d) reducing optical absorption and tensile stress in said core layer by subjecting said second structure to a second thermal treatment, said second thermal treatment comprising:

i) stabilizing a diffusion tube at a temperature at an initial stabilization temperature lying between 300°C and 700°C;

ii) inserting the second structure into said diffusion tube of step d(i) at said initial stabilization temperature;

iii) relieving tensile stress in said core layer from an initial tensile value by subjecting said second structure to a temperature that ramps up a rate lying in the range 1°C/min to 25°C/min to a constant temperature of between 600°C and 1300°C;

iv) reducing optical absorption by continuing to subject said second structure to said constant temperature ~~between 600°C and 1300°C~~in step d(iii) for a period of at least 30 minutes; and

v) causing said second structure to undergo elastic deformation and said tensile stress in said core layer to decrease linearly to a final tensile value that is less than said initial tensile value by ramping down said temperature to which said second structure is subjected to a final stabilization temperature a rate lying in the range 1°C/min to 25°C/min;

vi) extracting said second structure from the diffusion tube of step d(i) at said final stabilization temperature thereof; and

e) depositing a cladding layer over said core layer.

Claims 2 to 6 are canceled

7.(currently amended) A method as claimed in claim 1, wherein said rate in steps b(iv) and d(iii) is 5°C/min.

8.(canceled)

9.(currently amended) A method as claimed in claim 1, wherein in step b(i) said initial stabilization temperature is about 400°C.

10.(canceled)

11.(currently amended) A method as claimed in claim 1, wherein said rate in steps b(vi) and d(v) is 2.5°C/min.

12.(canceled)

13.(currently amended) A method as claimed in claim 1, wherein in step ~~b(ii)~~b(v) the constant temperature ~~of at least 800°C~~ to which said first structure is continued to be subjected is 900°C.

14.(previously presented) A method as claimed in claim 1, wherein said first and second thermal treatments are carried out in the presence of an inert gas.

15.(previously presented) A method as claimed in claim 1, wherein said first and second treatments are carried out in the presence of a gas selected from the group consisting of: nitrogen, oxygen, hydrogen, water vapour, argon, fluorine, carbon tetrafluoride, nitrogen trifluoride, and hydrogen peroxide.

16.(previously presented) A method as claimed in claim 14, wherein said inert gas has a constant flow rate.

17.(previously presented) A method as claimed in claim 16, wherein said flow rate of said inert gas lies in the range 1 liter/min. to 100 liters/min.

18.(canceled)

19.(currently amended) A method as claimed in claim [[18]] 1, wherein in step ~~d(ii)~~d(iv) the constant temperature ~~of at least 600°C~~ to which said second structure is continued to be subjected is 900°C.

Claims 20 to 31 are canceled.